

Abstract of the Disclosure

a A method for reversibly, or irreversibly, altering the permeability of cells, tissues or other biological barriers, to molecules to be transported into or through these materials, through the application of acoustic energy, is enhanced by applying the ultrasound in combination with means ^{devices} for monitoring and/or implementing feedback controls. The acoustic energy is applied directly or indirectly to the cells or tissue whose permeability is to be altered, at a frequency and intensity appropriate to alter the permeability to achieve the desired effect, such as the transport of endogenous or exogenous molecules and/or fluid, for drug delivery, measurement of analyte, removal of fluid, alteration of cell or tissue viability or alteration of structure of materials such as kidney or gall bladder stones. In the preferred embodiment, the method includes measuring the strength of the acoustic field applied to the cell or tissue at the applied frequency or other frequencies, and using the acoustic measurement to modify continued or subsequent application of acoustic energy to the cell or tissue. In another preferred embodiment, the method further includes simultaneously, previously, or subsequently exposing the cell or tissue to the chemical or biological agent to be transported into or across the cell or tissue. In another preferred application, the method includes removing biological fluid or molecules from the cells or tissue simultaneously, previously or subsequently to the application of acoustic energy and, optionally, assaying the biological fluid or molecules.